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2 PARTS — PART 2

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An Opportunity to Help

IT is said—with the merit of truth—that one receives from an organization much in proportion as one gives to that organization.

A code of professional practice for the engineer is in preparation and the members are asked to comment upon it to the end that it may be as nearly perfect as possible. Here is a chance to begin giving to the Society.

A Code of Professional Practice

TO seven members of the Northeastern Section, the Society and through it, the profession is indebted for a very careful compilation of a Code for the Guidance of Engineers in Professional Practice.

Leonard C. Wason, Chairman; Harrison P. Eddy; C. Frank Allen; Peter D. G. Hamilton; Lewis E. Moore; Barzillai A. Rich, and Sturgis H. Thorndike were appointed a committee in March, 1925, and held twenty-one meetings from which the document evolved.

The statement of a principle and a uniform understanding of the application of that principle are two quite different things, and the analysis made and concretely expressed by these members is a distinct contribution.

Part 1 of Proceedings, this issue, carries in full on page 415 *et seq.* the Code as it is now proposed and comment and criticism is solicited.

It is estimated that the study devoted to the original draft was in excess of 650 man-hours. Remarkable, isn't it, how when men become interested in a subject the time element accumulates? Worthy of remark, too, is the thought that if these experienced and busy men put that earnest time into it it is deserving of more than the passing interest of others.

The original draft was submitted by the Section to the membership resident near Boston and also to the Board of Direction of the Society and by the latter to its Committee on Professional Conduct. With only minor changes and an added thought or two it now appears in tentative form for the comment of the membership at large.

Undoubtedly there is the thought that, possibly with modifications or amplifications, it is in order for adoption and promulgation by the Society as its code of ethical procedure for the professional civil engineer.

The New Division

To Organize at Philadelphia Convention

THE new Surveying and Mapping Division, authorized recently, will hold its organization meeting on the morning of Wednesday, Oct. 6th, at the Philadelphia Convention.

A program that will serve to indicate the field which the new Division will cover has been arranged by those who have acted as a Temporary Executive Committee. This committee consists of William Bowie, Chairman; C. H. Birdseye; Clarence T. Johnson; R. S. Patton, and Arthur L. Vedder.

The Fountains at Versailles

WHEN, from dealing death in wholesale manner, kings turned to the pursuit of peace on the same scale, the military engineer without conscious effort became the civil engineer.

The problems were much the same. Bridges, roads or water supplies for armies involved the same general principles as the more durable structures desirable for communities at peace.

In both cases also, the carrying out of the plan required the physical help of many arms and backs and legs and these the army had. It had, too, a form of organization, another essential made necessary by the sheer size of the undertakings.

Analyist, deviser and organizer must be he who has now come to be known as a civil engineer and this type of man found his field, centuries ago, in the armies—armies that existed continuously either as fighting units or as builders of mammoth structures.

So it was that, two and a half centuries ago, Louis XVI found in the armies of France the brains and the brawn to work his imperious will, when—his Italian nature, loving the dashing fountain—he decreed that those which he would have at Versailles should exceed aught elsewhere in the world.

Versailles as a site for a development worthy of this extravagant court was the whim of a monarch rather than the result of a careful search of an engineer. It is said to have been "without prospect, without wood, without water, without soil; all shifting sand or swamp" and this in time became the Versailles that "cast

a glamour over Europe and brought those gorgeous envoys from Persia and Siam and the Grand Turk."

Water, Louis demanded, for his fountains, and Francini, his engineer, his "Commander of the Fountains," struggled first with the swamps from which he sought with his *Tour d' Eau*, a kind of mill worked by horses, to provide the means for the living jets that meant so much to his king.

But Louis was not satisfied. The flow being meagre, it was necessary for the gardeners to precede the king to turn on the fountains which as soon as he had passed were again turned off, a penury that was repugnant and forthwith there was undertaken the diversion of the Eure—a fateful endeavor.

Twenty-two thousand soldiers and eight thousand horses were employed on this project. A canal was dug and an aqueduct built, but the work was never made available to Versailles, other projects superseding it. A fiasco it proved, the greater part of both men and animals being rendered unfit by sickness and large numbers dying, to the extent, it is said, of one-third of the force employed.

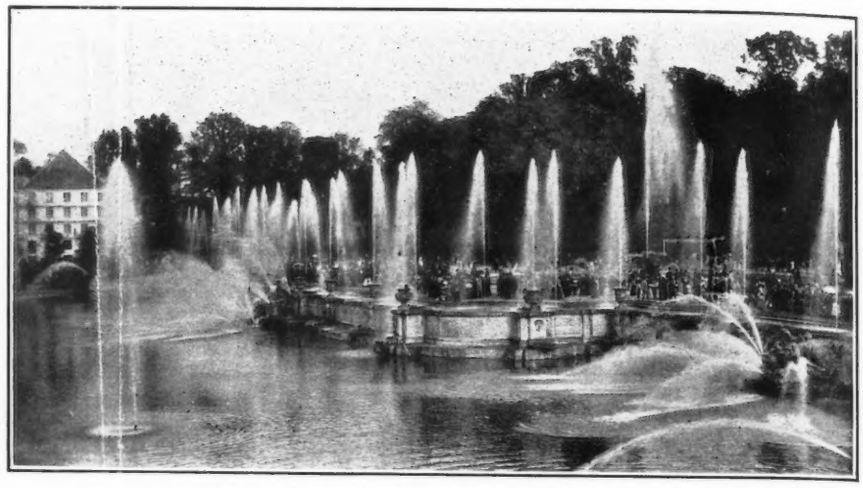
A simultaneous attempt of another sort also proved inadequate, from no lack of ingenuity, apparently, but rather from a lack of knowledge. Mechanics as well as hydraulic principles were this time employed and there was devised a machine on what, then, must have been a stupendous scale.

Islands in a river having a steep descent suggested the closing of the several gaps with dams of moderate length by which the level of the water might be raised so as to provide an artificial waterfall, quite as is done today.

Power! Water in large masses, falling, possessed the energy, if harnessed, to lift other masses of water. If much water fell a short distance it could be made to lift smaller masses of water a greater height.

Inserted into the falling water were fourteen wheels, each fitted with blades upon the exterior and with shafting so located that the water in its descent impinged upon one blade after another, making the wheels turn and, with them, the shaft.

Here was power harnessed, available for use, ready to do the will of the master, and by lever arms, it actuated pumps. Three hundred and sixty-four pumps there were in three stages, the first group at the river level to lift 50 meters to a reservior on the side of the hill.



Part of the Fountains at Versailles, styled "The Basin of Neptune"

Above was a second group, to lift to another reservoir, and still above a third group lifting to the top of the hill, a total of over 500 feet. From thence, the water, so much desired, was to press downward again, through conduits and pipes, to gush upwards at last in the glorious fountains Louis pictured in his mind.

But the Machine at Marny failed of its purpose, after seven years spent in its construction—because of friction, and as we look back we may realize something of the slow processes by which the laws of nature have been wrested, painfully, by the engineer, step by step, from failure after failure, and in success after success for the benefit of mankind.

The conception was magnificent—its details were not comprehended.

But the fountains of Versailles were soon to be a glorious success. By a vast network of ditches and channels the rains and melting snows of a remote plateau were collected into an aqueduct that was no less in effect than a river, an artificial river of nearly 100 miles in length—its terminus, Versailles.

There it entered the conduits built by Francini, to re-appear in the gushing fountains that Louis had set his heart upon. Through a maze of pipes, skillfully concealed, the water pressed this way and that, here to a grotto, there to a grove, and again to a basin, flowing sometimes in beautiful cascade from pool to pool and sometimes disappearing below ground only to re-appear at a lower level of the gardens where once more impelled by accumulated pressure behind, it dashed itself upward in jets of living waters, to the glory of France and her king.

The desire of a king, the concept of his engineers, the work of his army, persisted in for over twenty-five years, reached a culmination in the Fountains of Versailles—famous even today for their beauty but in Louis' day of a volume and grandeur that merited for Versailles the appelation *La Cité des Eaux*.

Some Peculiar Requests

WITH the great volume of mail coming to the Society daily, it is not surprising, perhaps, that a considerable number of requests for information on a wide variety of subjects should be received. The requests themselves often are the most surprising part of the proceeding.

Take the case of a prominent motion picture producing company, for example. One of the executives of this company asked for the name and location of what might be termed the ideal type of arch bridge, with the appended specification that it must span a deep canyon and be suitable for an artistic camera study in connection with the action of the drama. Another man asked that the Society arrange to survey a lot on which he planned a dwelling. In another case an inquirer earnestly requested the magnetic deflection at a small town near New York City.

September Proceedings

THE September issue of Proceedings, Part 1, is another large and varied number with many papers and discussions.

"The Ancient Roman Aqueduct at Athens, Greece," as revealed by recent examination and reconstruction, is shown by James F. Case, Member, to be a noteworthy engineering work, even when judged by modern standards.

"Effect of Lightning on a Reinforced Concrete Pavement" was found by Winston E. Wheat, Associate Member, to be distributed over a distance of 1,560 feet, affecting, however, only the joints.

"Sag-Tension Curves," by Edwin S. Parker, Associate Member, gives a new method of finding the arcs described by long cables, for use in stringing transmission wires.

"The Engineer and the Town Plan," by James Ewing, of Montreal, holds the looking glass up to all engineers, more especially town planners.

"Aerial Surveys for City Planning" are explained by Gerard H. Matthes, Member. This is a complete summary of present practice.

Many of the excellent papers delivered before the Technical Divisions at the Montreal Meeting (October, 1925) are included in this issue. "The Water Supply System of Montreal, Quebec, Canada," is concisely described by Frederick E. Field, Member. A Symposium on Grit Chamber Practice contains papers by George B. Gascoigne and Karl Imhoff, Members, and by F. A. Dallyn and Arthur J. Martin, covering practice in the United States, Germany, Canada and England.

In "Producing Concrete of Uniform Quality," Roderick B. Young, of Ontario, throws new light on the value of care in determining proportions, in measurement, in workmanship and in testing. The actual results on several jobs support his views.

A "Water-Ratio Specification for Concrete" is proposed by F. R. McMillan, Member, and Stanton Walker. With good aggregates the proportion of water to cement, they feel, is the key to strength "provided only that the concrete is plastic."

A Symposium on Unit Stresses conducted by the Structural Division on October 28, 1925, produced brief resumes by F. E. Turneaure, Member, on the general subject; by D. B. Steinman, Member, covering Steel for Buildings; by A. E. Lindau, Associate Member, on Concrete; and by J. A. Newlin, Member, on Timber. The present joint publication answers a wide demand for expert opinions on present trends in Structural Unit Stresses.

Besides these valuable papers, 41 discussions on 14 other papers and 9 memoirs are included.

Alaska—1926 Denver—1927 San Diego—1928

THOSE who took the trip to Alaska, arranged in connection with the Seattle meeting, are already talking about another trip for next summer at the time of the Denver meeting.

A trip of about 3 weeks, costing about $400, is what some propose. That would give just about enough time to leave New York or other eastern points, go through the Yellowstone, attend the meeting in Denver, visit Estes Park, and Colorado Springs, also the Garden of the Gods and Pikes Peak and return to the east.

Some suggest that after visiting "The Springs" they might go on through the Royal Gorge to Salt Lake City, then down to Zion Park, Cedar Brakes and the North Rim of the Grand Canyon. From there the return might be made fairly quickly by way of Ogden and the Union Pacific or a little more slowly by way of Los Angeles and then the South Rim of the Grand Canyon via the Santa Fe.

The longer trip does not appeal to all as some propose saving Salt Lake, Zion, the Brakes, Los Angeles and the Grand Canyon for the meeting at San Diego, scheduled tentatively for the fall of 1928.

Those who made the Alaska tour have nothing but good words for the perfection of the details arranged.

For those who prefer a few days on the links in the spring, the meeting next April at Asheville provides a good opportunity, but no regular trip will be organized in connection with it unless the members on the Pacific coast wish that done.

The Institution of Civil Engineers

THE Institution of Civil Engineers (Great Britain) is the pioneer of all national engineering societies existing today. It was founded in 1818.

Certificates are issued in form suitable for framing but the Institution has no official badge. One sees on letterheads or professional cards of members the words "Chartered Civil Engineer."

By legislative enactment any Member or Associate Member of the Institution is a "Chartered Civil Engineer" (see March, 1924, Proceedings, P. 115). This not only takes the place of registration or licensing but puts it on a high plane. Membership is the only access to this coveted title.

By comparison, the membership requirements of the Institution are somewhat higher than those of the Society:

	I. C. E.	A. S. C. E.
Member		
Minimum Age	33 years	30 years
Experience	*	10† years

**Either Associate Member for 5 years or Education plus 15 years' responsible charge plus eminence in the Profession. Also one must be actively occupied in responsible work.*

†Of which 5 years must be responsible charge of work.

Associate Member		
Minimum Age	25 years	25 years
Experience	5-7 years	6 years
Responsible charge	——	1 year

Requirements for Associate Membership, and consequently for Membership, are more complicated than the table can show. The English system of apprenticeship in engineering is recognized prominently. In addition to 3 years as an apprentice, the applicant must have one year each in design and in construction—5 years in all. University training is given about half credit as "experience." If he has not been apprenticed, seven years' experience is necessary. Candidates are further required to pass examinations.

The initiation fees are more than double those of the Society. Also Members' dues are 20 to 30% higher. Associate Members' dues are 20 to 30% lower.

The total membership of the Institution is about 9,700. Of these, 24% are Members. Here again comparison may be made with the Society in which 45% of the total membership consists of those in the Member grade.

The Convention in Philadelphia

THE Program for the Convention of the Society, to be held in Philadelphia in October next, which is now on the press and should be in the hands of the membership in a few days, will be found to foretell an unusual meeting.

The anniversary of the founding 150 years ago, of the American republic provides an occasion for a review of the activities of the civil engineer during the same period, and many such historical surveys are promised. Doubtless they will be published, but they should be heard to be fully appreciated and to be of immediate value.

Each Technical Division, of which there are now nine, will have a program, some of them requiring two sessions; the Board of Direction is to meet; the Conference of Local Section representatives is to be held on Wednesday; the President is to give his annual address; historical papers are to be presented by visiting representatives of foreign societies; the Technical Procedure Committee is to hold its semi-annual meeting, and numerous visits to engineering and historical points of interest are planned.

Philadelphia is within 150 miles of the homes of close to 3,000 members of the Society, and the meeting of old friends and the making of new friends should be a feature almost as influential as the technical program in bringing about an unusually large attendance.

The Philadelphia Convention has all the marks of being a great success.

Society Badges

PROBABLY it is not known to all of the younger members of the Society that there are two styles of badges for Corporate Members. The style now in use was adopted in 1894, prior to which the one bearing the Wye level was the official emblem for 10 years. This older type is therefore to be expected to be displayed by only those who have been Corporate Members for over 32 years. Naturally it is much prized.

The use of the official badge on letterheads, programs, circulars or other printed matter is not authorized except when such matter emanates from Society headquarters and is, therefore, an approved activity of the Society, a rule that long since was deemed necessary as a protection to the membership.

Former Style
1884-1894

Present Style
since 1894

Applications Increase 43 Per Cent

LAST month's issue contained a statement that applications for admission to the Society for the first seven months of the year were 38 per cent in excess of those received during the same period in 1925.

Another month's figures are now available and the excess has increased to 43 per cent.

A Mail-Order Library

By Harrison W. Craver, Director

THE mail of a day recently brought to the Engineering Societies Library a request from Alaska for information on the proper method of treating an unusual gold ore, and one from Germany for information on composition flooring. The day before, a member in Morocco asked for the best book on the metallurgy of copper, another in Seattle for a rare work on radio-communication, and a third, on a far-away Pacific Island, for a book on harbor work.

These letters from far-away places are interesting, but no more so than the constant stream of requests from members in all parts of the United States.

Even in this land of libraries there are few places except the large cities, which make any adequate provision of professional literature. To the great majority of the membership, that portion residing outside the larger cities, the Library is a most important feature in the service obtainable through the Society. The steadily increasing use of it shows that it is much appreciated.

Test Dam Shows Progress

WORK on the Stevenson Test Dam is reported to be progressing most satisfactorily. The structure has been completed to the 60-foot height, and actual tests and test measurements have now been in process some nine weeks.

The Committee consists of Charles D. Marx, Chairman; Fred A. Noetzli, Secretary; Paul Bailey; C. Derleth, Jr.; H. W. Dennis; Alfred D. Flinn; H. Hawgood; D. C. Henny; M. M. O'Shaughnessy; H. Hobart Porter; F. E. Weymouth; Silas H. Woodard, all members of the Society, although the undertaking is not formally a Society activity. W. A. Slater, also a member, lent by the U. S. Bureau of Standards, is conducting the tests, and the Society is paying the salaries of the six observers assisting him.

Engineering Foundation, which is the unit set up by the four Founder Societies to administer funds collected for engineering research, and in the management of which the Society is equally represented with the three other Founder Societies, collected and is distributing the monies.

A Unique Contract

THE late Samuel M. Gray, member of the Society, noted for his sanitary engineering work, used to say that the best contract he ever had was written on the back of an envelope.

As Mr. Gray told the story, he needed a sewage pumping engine and needed it in a hurry. George Corliss, a famous builder of engines, and a friend of Mr. Gray's, then had one under construction for another project, and Mr. Gray got Corliss to let him have it. Mr. Corless took an old letter out of his pocket and wrote on the back of the envelope, "I will undertake to furnish one pumping engine of —— capacity for —— dollars." Under Corliss' name Gray signed "accepted, Samuel M. Gray."

Judged by the results, this contract was as satisfactory as any "standard" or other form ever instituted but the merit is most probably in the characters of the two men concerned.